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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/026,524	12/27/2001	Yoshikazu Miyanaga	12290/1	9409

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EXAMINER

VO, HUYEN X

ART UNIT PAPER NUMBER

2655

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/026,524

**Applicant(s)**

MIYANAGA ET AL.

**Examiner**

Huyen Vo

**Art Unit**

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-7,9 and 10 is/are rejected.
- 7) ☒ Claim(s) 3 and 8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/29/2002</u> . | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless – (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Marshall et al. (US Patent No. 6014685).

3. Regarding claim 1, Marshall et al. disclose a speech recognition device, comprising a similarity circuit that receives input signals composed of multi-dimensional vectors corresponding to the spectrum envelope of speech inputs to be recognized and puts out characteristics based on the self-organizing algorithm (*col. 9, ln. 16 to col. 10, ln. 46 or referring to figure 1, Euclidean determination is used in speech recognition system. Therefore, spectrum envelope vectors of speech are used*), and a matrix circuit that performs matrix operations of the output signals of said similarity circuit (*equations 24-25, multi-dimensional vectors operation*), wherein said similarity circuit comprises a circuit to calculate a distance between said multi-dimensional input vector and a pattern vector prepared in advance for speech recognition (*col. 9, ln. 16 to col. 10, ln. 46*), calculates a value corresponding to one dimension using a pair of neuron MOSFETs for each dimension (*col. 9, ln. 16 to col. 10, ln. 46*), and forms a voltage signal in accordance with the degree of similarity by summing the current that flows through each

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neuron MOSFET (*col. 9, ln. 16 to col. 10, ln. 46 and equations 24-25 in col. 17*); and said matrix circuit, in which capacitors corresponding to weighting operations are arranged in matrix, receives the voltage signal in accordance with said degree of similarity and puts out what is most similar to said patterns prepared in advance from among the matrix operation results as the recognition result (*col. 8, ln. 12 to col. 9, ln. 10*).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2, 4-7, and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marshall et al. (US Patent No. 6014685) in view of Salem et al. (US Patent No. 5305250).

6. Regarding claim 2, Marshall et al. further disclose a speech recognition device, as set forth in claim 1, wherein said two neuron MOSFETs are of n-channel type and the drains of neuron MOSFETs for plural dimensions corresponding to the spectrum envelope of speech input are connected commonly to sum the drain current (*M1 and*

*M2 in figure 1*); and said summed drain current is made to flow into a p-channel MOSFET that converts the drain current into a voltage signal (*D1 and D2 in figure 1*).

Marshall et al. fail to specifically disclose that the connection node, to which the drain of said p-channel MOSFET and the drains of the neuron MOSFETs commonly connected are connected, is connected to one of inputs of an operational amplifier circuit; the output voltage of said operational amplifier circuit is supplied to the gate of said p-channel MOSFET; and the other input of said operational amplifier circuit is provided with an bias voltage that operates said neuron MOSFET in a saturation area and said p-channel MOSFET, in a non-saturation area.

However, Salam et al. teach that the connection node, to which the drain of said p-channel MOSFET and the drains of the neuron MOSFETs commonly connected are connected, is connected to one of inputs of an operational amplifier circuit (*col. 10, ln. 18-67 and/or figures 1 and 3*); the output voltage of said operational amplifier circuit is supplied to the gate of said p-channel MOSFET (*col. 10, ln. 18-67 and/or figures 1 and 3*); and the other input of said operational amplifier circuit is provided with an bias voltage that operates said neuron MOSFET in a saturation area and said p-channel MOSFET, in a non-saturation area (*col. 10, ln. 18-67 and/or figures 1 and 3*).

Since Marshall et al. and Salam et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Marshall et al. by incorporating the teaching of Salam et al. in order to provide greater fan out capability.

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7. Regarding claim 4, Marshall et al. further disclose a speech recognition device, as set forth in claim 2, wherein dummy capacitances are added to said matrix circuit if necessary to equalize the input capacitance of plural input terminals to each other (*the ratio of  $C_{sub.pp}/C_{sub.tot}$  can be determined and adjusted*).

8. Regarding claim 5, Marshall et al. further disclose a speech recognition device, as set forth in claim 4, wherein said matrix circuit is provided with a comparison capacitor in accordance with an input signal (*col. 8, ln. 49 to col. 9, ln. 67*); plural voltage comparison circuits, which regard the voltage formed by said comparison capacitor as a reference voltage and correspond to the speech recognition outputs that receive each matrix operation output, respectively, are provided (*col. 8, ln. 49 to col. 9, ln. 67, this is in the case of one dimension. In the case of multiple dimension col. 11, ln. 1 to col. 12, ln. 67*); and a speech recognition output is obtained from each voltage comparison circuit (*col. 11, ln. 1 to col. 12, ln. 67*).

9. Regarding claims 6-7 and 9-10, Marshall et al. further disclose a speech recognition device, as set forth in claims 1-2 and 4-5, wherein each of said circuit blocks is formed on a substrate that constitutes an integrated circuit (*figures 1 and 5-6 is IC*).

***Allowable Subject Matter***

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10. Claims 3 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is an examiner's statement of reasons for allowance: Marshall et al. disclose an electronic circuit for determining the similarity between reference and data points (*the operation of figures 1 or 6*). Salam et al. teach a neuron circuit having an operational amplifier (*figures 1-3*). Both prior art of record fail to specifically disclose that the output signal of said first source follower output circuit is supplied to the gate of said p-channel MOSFET, and the output signal of said second source follower output circuit is supplied to said matrix circuit as an input voltage. Furthermore, it would have not been obvious to one of ordinary skill in the art at the time of invention to modify the teaching of Marshall et al. and/or Salam to realize the claimed invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huyen Vo whose telephone number is 703-305-8665.

The examiner can normally be reached on M-F, 9-5:30.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 703-305-4827. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Examiner Huyen X. Vo

October 30, 2004

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SUSAN MCFADDEN  
PRIMARY EXAMINER